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houses themselves may overflow, or be broken into and their contents scattered. That one kind of plant should supersede another, or that one kind should grow so vigorously as to choke out all others, is merely an illustration of the "survival of the fittest."—MRS. J. M. MILLIGAN.

SOME LARGE WALNUTS.—In the GAZETTE I see notes occasionally of unusually large growths. The following may be of interest in this connection. A small *Juglans nigra*, about six inches in diameter and about twenty feet high, bore three pecks of fruit, which average near $11\frac{1}{2}$ inches in circumference, and $10\frac{3}{4}$ ounces in weight. The tree grows in a field, and has no unusual appearance, except the fruit, which looks more like that of the Osage Orange.—DR. J. SCHNECK, *Mt. Carmel, Ill.*

THE RANGE OF THE COMMON HUCKELBERRY IN MISSOURI.—The common huckelberry is not found north of a certain N. W. and S. W. line. Its northern extension is as follows: I have found it on Cuivre bluffs near Troy, Lincoln Co.; also in the northwest part of St. Charles county; on Missouri bluffs as far west as Jefferson City; near Versailles in Morgan county; at Clinton, in Henry county; and in Jasper county; thence it passes southwestward. It is invariably found on either flinty or sandy soil, or where there is but little soil. It abounds chiefly in the pine region of South-eastern Missouri.—PROF. G. C. BROADHEAD.

SOME NEW STATIONS.—The neighboring county of Clark bids fair to equal Jefferson in the number of its good plants. When it is thoroughly worked up we hope to be able to report many rare things, but those enumerated below are worthy of special mention. While doing some field work last May with one of the College classes, Mr. Chas. R. Barnes called my attention to an odd little Crucifer clinging to the edges of some shaly limestone bluffs. The plant seemed to have suppressed every other part for the benefit of its enormous pods, which were more than half as long as all the rest, and a much more noticeable object than the inconspicuous lyrate root leaves. The little stranger proved to be *Leavenworthia Michauxii*, Torr., growing there in sufficient abundance to satisfy the rapacity of even a botanist possessed of the mania for exchanging. Within a few miles of the above, later in the season, Mr. John F. Baird, collected some fine specimens of *Sullivantia Ohionis*, T. & G., and reported that it was growing in greater abundance even than at Clifty Falls, the habitat of specimens that are to be found in very many of the herbaria of the land. Of course it was growing upon damp limestone cliffs, sending its roots down into the soft, spongy moss. Mr. Baird also collected specimens of *Oleome pungens*, Willd., that to all appearances were perfectly naturalized.—J. M. C.

BOTANICAL EXCURSIONS, No. 1, BY J. G. LEMMON.—THE GREAT BASIN.—The great basin of America is the bed of the evaporated Mediterranean sea of the western continent. Situated on the same parallels as its Eastern prototype, bordered like that on all sides with high ranges of mountains, it differs from it in two particulars, which render the one a very salt sea and the other a very salty desert.

The Mediterranean sea fills a deep chasm in the earth's crust 2,000 to 6,000 feet deep; lying between 30 deg. and 46 deg. north lat., and almost constantly swept by the dry winds of the great Sahara, its waters are evaporated at an immense rate, which would, ages ago, have emptied its basin but for the other important fact, the Strait of Gibraltar, through which a strong current ever comes from the ocean; and this, in addition to the mighty rivers which empty into the sea, and all to restore the equilibrium disturbed by evaporation. To this evaporation—this lifting of a sea into the air—is Europe indebted, mainly, for its exceeding fertility. The dry South wind is a sponge which takes up the waters of the Mediterranean and, condensed by the cold summits of the mountains of Europe, showers its waters over the plains. To this fact also is due the intense saltiness of the Mediterranean, for salt is the residuum of evaporation.

The Mediterranean desert of America is elevated about 5,000 feet above the ocean, so its waters would naturally sink in the earth. Then there are no mighty rivers feeding it, much less a Gibraltar strait, bringing in a flood from a neighboring ocean.

The towering rim of mountains on the West prevents the moist winds of the Pacific from entering the basin; the lofty Eastern rim bars out the Gulf winds; the lower North and South rims admit only the hot, dry, South winds of the Colorado to sweep over the basin, absorbing at their founts the few meager springs that rise at the mountain borders; so we have an immense frying pan or bake oven, as if scooped out of the highest mountains of North America.

It is oblong-elliptical in shape. Its western end rests upon the snow-clad Sierra, the eastern upon the lofty Wasatch range—a spur of the Rocky Mountains. On its smooth bottom are ranged, side by side, steep ranges of mountains running north and south, like cross-bars of a gridiron. The highest of these, the Humboldt range, divides the basin exactly in the center, and the short rivers running from the mountains on all sides form sinks or salt lakes in each end, to which numerous systems of hot springs add alkali, sulphur and other minerals, so that the sinks are generally extremely offensive.

The most important rivers of the eastern depression are Bear river; on the north, and Sevier on the south, each emptying respectively into Great Salt Lake and Lake Sevier. The rivers of the west end are Humboldt and Susan on the north, debouching respectively into Humboldt sink and Honey lake; and Walker, Carson and Truckee on the south, filling respectively Walker, Carson and Pyramid lakes—the latter of which we propose to visit.

And now, dear readers, you must allow me the privilege of walking, to gather and study the plants by the way. See here, before getting out of Sierra valley, what beautiful specimens of the four new *Astragali*, viz: *A. Lemmoni*, *A. Pulsifera*, *A. Webberi* and *A.* (unnamed), each particularly abundant along the bottom and sides of Beckworth pass, as if the seeds were sown here by the water current surging through here ages ago.

FLORA OF THE GREAT BASIN.

Emerging through this cleft in the high Sierra, and coming into full view of the shimmering basin below, with the snow-tipped Humboldts in the distance, I will leave you to contemplate the scene, while I pick up this desert plumb, *Prunus Andersoni*, this worm bush *Sarcobatus vermiculatus*, the first of the desert plants met with on the down grade.

Here on the floor of the basin, radiant with beauty, grows the only plant Dr. Gray will allow named for him on the western continent, *Grayia polygaloides*. It is a bush two to five feet high, densely crowded with spikes of flat circular pods, half as large as five cent coins and red as cherries; "neat but not gaudy," is the Doctor's apt description.

A large part of the flora of the basin belongs to the order of *Ulenopods*, or the goose-foot family, distinguished by their thick, hairy, succulent leaves, often shiny stems, and the extreme loneliness of the entire order, with the exception of the *Grayia* mentioned. The order most numerous is the one everywhere most abundant, found on every spot where vascular plants may thrive, the immense order of *Compositæ*, or sun-flowers. This order comprises about 10,000 species, and forms, according to Humboldt, one-ninth of all the flowering plants of the globe and one-half of its tropical flora.

Chief among this order in the basin is the renowned "sage brush," a name loosely applied to several kinds of plants having the same ashen hue, and found on the great arid plains from the forest-clothed slopes of the Sierra to the bottom lands of the Missouri.

Whatever the order or genus, all is modified to conform to the requisites of this hot region; thick leaves to hold the moisture when the sun is high; copious, non-conducting hairs, to prevent exhalation; sharp, forbidding spines, to ward off enemies of the animal kingdom. This spinescent character is most puzzling to the reflecting mind. What need of such protection in a region so desolate, so unfrequented? The rich open prairies and forests of other lands invite population. This arid, seemingly waterless basin is clothed, except where bleak alkali and salt deserts prevail, with dense, thorny, almost impassable sage brush, as if to guard a priceless treasure. And Darwin says it is so. He affirms that here are reservoirs of elements now unfit for use, which the art of the coming man will turn into verdant forests or beautiful fields, as the needs of a teeming population will demand. Corroborative of this theory, most wonderful vegetable growths are now seen in the valley of the Jordan, tilled by the devoted Mormon, and in the valley of the Carson, verdant with alfalfa; both of these valleys immensely changed in value as the result of irrigation skillfully applied on a large scale. But I must hurry up or you will leave me pondering here in the sand.

The first of the valleys between the cross-bars of the gridiron is Long valley, threaded in winter and spring by Long Valley creek, rising near Reno and running north to Honey lake. Passing down it 25 miles we turn eastward through a cattle range enclosed by a fence of matted willows, climb the first ridge and Soda Lake valley is before us. The lake is a yellow pool of salt, alkali and sulphur. Crossing to the second ridge and climbing it, we look over into Winnemucca valley. On the pass at our feet is a beautiful *Scutellaria nana* (Gray), a new species. It maintains its green, robust look by means of reservoirs of plant food stored in its thick, necklace-like, subterranean stems. The next is Warm Spring valley, quite large and important. Through it passes the road from Reno to Surprise valley and Fort Bidwell. Passing around a sand mountain, gemmed with rare *Eriogonas*, we ascend an arm of Warm Spring valley, move over a high pass and drop into a valley so walled in with sheltering ridges as to afford a surprisingly large and varied flora.

Every mile of our progress to this point has been marked by decreasing verdure and the appearance of the peculiar ashen, dwarfed, desert plants. But here in this little valley all the species met with on the way are crowded, while hosts of strangers appear. In rapture, I named it for the veteran botanist,

GRAY'S VALLEY.

Here in this secluded garden of the great basin is the natural home of the sand and sun-loving plants, too numerous to name—all putting on their gayest apparel and exhaling the richest perfumes, as if to prove the oft-quoted lines:

Full many a flower is born to blush unseen
And waste its sweetness on the desert air.

Here flourishes *Tetradymia spinosa*, with strong, hooked prickles; the monster *Thelipodium*, four to six feet high. Up on the hot sand bluffs stands, sentry-like, the scrubby crucifer *Stanleya pinnatifida*, with spikes of yellow flowers 18 inches long, terminating upright; white limbs four to six feet high. On the clean sand by our feet nestles the curious *Coldenia nuttallii*, the purple *Comanthus arctioides*, the yellow *Emmeranthe glandulifera*, the snake-head like *Anisocoma acule* and several species of the ever beautiful *Eriogonas*; but most striking of all uprears the rare *Abronia Crux-Malte* of Dr. Kellogg, holding at arm's length its large balls of pink flowers. Over the dry water-course, *Oleome lutea* peers; from the rocks on each hand hang *Pentstemon*s and *Arenarias*, while the gorgeous *Eschscholtzia* shows its red eyes between the clefts, and the immortal *Lewisia rediviva* on the gravel above aspires to notice by creeping to the edge of the precipice.

This plant is well named *rediviva*. Roots gathered nearly two years ago are growing still in their papers despite heavy pressure, illustrating the power with which they

are endowed to resist the severities of the basin climate. Deep rooted in the volcanic ashes of yonder bench glows *Opuntia pulchella*, the prettiest of the *Cacti* family, and that odd little stiff-leaved, crimson *Oxytheca perfoliata*. Under the spiny bushes of *Bigelovia graveolens* carpeting the whole valley, are seen a few plants of *Pectocarrya penicillata* strayed away from the coast, and *Blitum carinatum*, only found before in Australia.

RECENT PUBLICATIONS.—*American Journal of Science and Arts*, January Dr. Gray gives a review of Darwin's late work on "The Different Forms of Flowers on Plants of the same Species." This paper came to hand most aptly just as we had finished reading the book. Dr. Gray, of course, does not mention that the work was dedicated to him, but so it is, and we are glad of it, for it is a deserved compliment. It was refreshing to see all through the book the notice that was taken of American botanists, for it is a sign that they are not all completely absorbed in Systematic Botany, which, in a country comparatively new, very justly has a controlling interest, but are beginning to study life histories. Dr. Gray adds another genus and natural order to the list of cleistogamous flowers. Mr. C. G. Pringle, of Charlotte, Vermont, has found excellent examples of cleistogamous flowers in *Dalibarda repens*, of the order *Rosaceæ*. Mr. Pringle also announces the discovery of cleistogamous flowers regularly occurring within the leaf-sheaths of *Danthonia spicata* and its allies, also in *Vilfa* and other grasses. Mr. Darwin adopts Hildebrand's term of *heterostyled*, instead of *heterogone* or *heterogonous* suggested by Dr. Gray. The first six chapters "relate to di-morphous blossoms, such as those of Primrose and *Houstonia*, including also the trimorphic cases, as of *Lythrum Salicaria* and some species of *Oxalis*. The seventh chapter discusses Polygamous, Dioecious, and Gyno-Dioecious Plants; the eighth and closing chapter is devoted to Cleistogamous Flowers."

American Naturalist, January.—The botanical notes are "Notes on the Alpine Flora of Mt. Shasta," and "Production of Apples in 'off' Years," both by Dr. A. S. Packard. The *Naturalist* comes for the first time from Philadelphia, from the press of McCalla & Staveley. The press work is as fine if not finer than ever, and under the editorial management of Dr. A. S. Packard, Jr., and Prof. E. D. Cope, it promises to its patrons everything needed in a journal devoted to Natural Sciences. In looking over the different departments, we see them all in the hands of specialists except Botany. It is hard, even for a journal devoted to natural sciences in their widest sense, not to become special in its tendency. It would require wonderful skill and self-denial for two such eminent Zoologists as Dr. Packard and Prof. Cope not to throw the weight of their favor on the side of Zoology. We are not decrying Zoology, for next to Botany it has a warmer place in our affections than anything else, but we are asking for a fair representation.

Bulletin of the Torrey Botanical Club, November, December and January.—The November number is filled by a contribution from Francis Wille. He gives a list of Fresh Water Algae, the work of the past twelve months. It contains 150 forms new to the United States and 24 new to science. Two new genera also are described. In the December No. a new species of *Danthonia* is described by C. F. Austin, and named for its discoverer, *D. Faxonii*. The species is allied to *D. spicata*, and was found at the Notch of the White Mts., N. H. Mr. Davenport describes a new *Cheilanthes* found in California, and names it *C. viscida*. The species seems intermediate between *C. vestita* and *C. Cooperæ* and will be figured in an early number of the "Illustrations of the Ferns of North America." In the January number we note Mr. Geo. E. Davenport's valuable contribution on "Vernation in Botrychia, with special reference to its importance as a means for distinguishing the different species." The different species of *Botrychium* have so long been puzzles to botanists that Mr. Davenport has tried to